

## 61-20-00

## CONTROLLING

The propeller blade pitch change is conducted by a governor (refer to Figure 1). Once an engine rotational speed is selected it will be held constant independent of airspeed or power variations.

The governor itself is actuated via a vernier control cable ending on the left side of the rear cockpit (blue control knob; 1, figure 1 & 8, figure 2). This cable is routed on the left side of the fuselage, penetrates the firewall, the rear engine baffles and is then routed to the governor. The cable is attached at its front end to the engine by a clamp block and in the cockpit area to the steel tube structure by self-clinching plastic tiedown straps. The RPM vernier control unit is mounted to a fuselage bracket. The firewall and engine baffle penetrations are covered with clamp sheets. The firewall penetration (2, figure 1) is additionally sealed with PRC-812 (Products Research & Chemical Corp., USA) firewall sealant.

Mechanical stops for low pitch and high pitch limit the pitch change level. In case the oil pressure is lost, the installed counterweights automatically force the blades into high pitch.

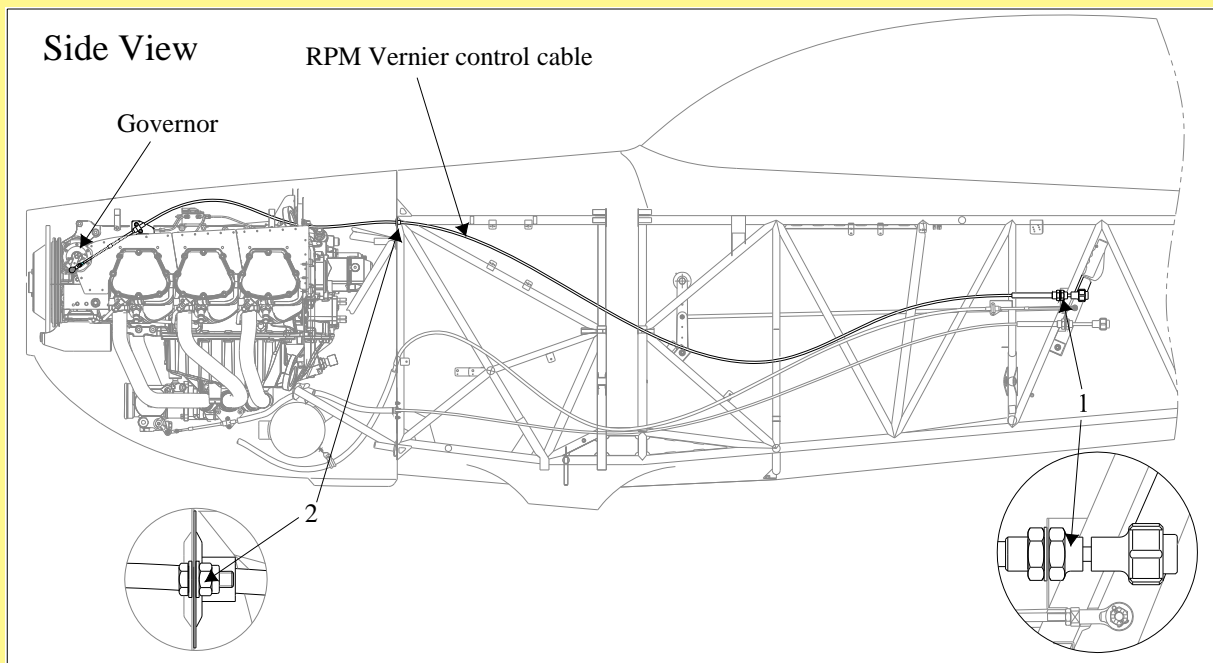


Figure 1

Controlling

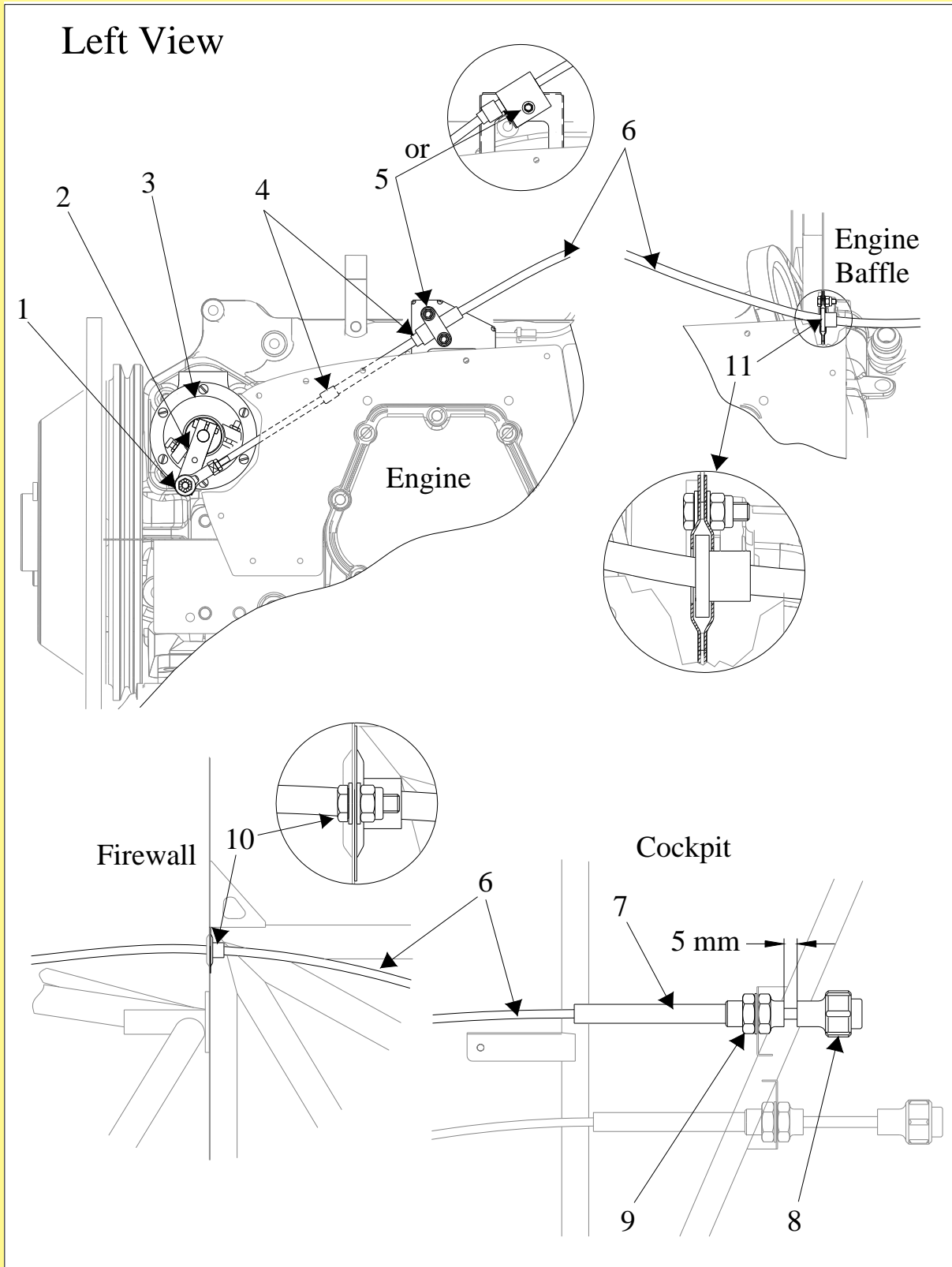


Figure 2

RPM Vernier Control Cable Installation

## 61-20-01

### Governor

One of the following governors is installed:

MT-Propeller P-880-41, preset for a max. 2600 rpm

MT-Propeller P-880-5, preset for a max. 2700 rpm

Woodward A-210988, preset for a max. 2700 rpm

Refer to the MT-Propeller Operation- and Installation Manual E-1048 for further information.

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#### NOTE

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**The lever position of the governor actuator is preset. Do not change this position.**

## 61-20-02

### RPM Vernier Control Cable

Refer to chapter 20 for general information about handling of control cables.

#### Removal

- 1 Ensure master switch is off.
- 2 Remove engine upper cowling per Chapter 71.
- 3 Remove main and bottom fuselage cover per Chapter 53.
- 4 Remove cotter pin, castle nut, washers and bolt from the rod end (1, Figure 2) to governor control lever (2) attachment.
- 5 Loosen counter nut and remove the rod end (1) from the vernier control cable (6).
- 6 Remove rod end counter nut and vernier control cable protective swivel and wiper seal (4).
- 7 Remove clamp block (5) attachment bolt(s).
- 8 Remove clamp block from the vernier control cable (6).
- 9 Remove 2 bolts of the clamp sheet attachment positioned at the rear engine baffle break through (11). Disconnect both clamp sheets and contained plastic guidance from the engine baffle.

- 10 Remove 2 bolts of the clamp sheet attachment positioned at the firewall break through (10). Disconnect clamp sheet and contained plastic guidance from the rear side of the firewall.
- 11 Mark vernier control cable routing and remove the self-clinching plastic tiedown straps in the cabin area.
- 12 Remove attachment nut (9) and washer of the vernier control unit (7).
- 13 To remove vernier control unit from its bracket, pull the unit slightly aft (about 15cm [0.5ft]) and then to the LH outside direction.
- 14 Pull complete vernier control cable (6) aft to remove from aircraft. Secure clamp sheets.

### **Installation**

Install in reverse sequence of removal observing the following items:

- 1 Thread the respective clamp sheets and plastic guidance on the vernier control cable before penetrating the firewall and the rear engine baffle.
- 2 Install rod end to the vernier control cable terminal. Ensure thread of control cable terminal is visible in the inspection hole.
- 3 Renew the sealing of the firewall break through at the engine side of the firewall. Use PRC-812 (Products Research & Chemical Corp., USA) firewall sealant.
- 4 Tighten the castle nut slightly. Ensure movability of governor control lever (2).

### **Rigging**

- 1 Move vernier control knob (8, Figure 2) to the foremost position.
- 2 Check that the travel stop at the governor control lever is reached, and the over-travel of 5mm [3/16"] (tolerance +/- 1 mm [1/32"]) is ensured at the rpm control knob (see figure 2).

- 3 Check full travel.
- 4 If necessary adjust rod end (1, figure 2) by the following steps:
  - a Remove cotter pin, castle nut, washers and bolt from the rod end (1) to governor control lever (2) attachment.
  - b Loosen the counter nut and adjust rod end (1) by turning. Ensure thread is visible in the inspection hole when fastening. Apply inspection lacquer on the counter nut.
  - c Reconnect the rod end (1) to the governor control lever (2).

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## 73-20-00

## CONTROLLING

### 73-20-10

### Throttle

Refer to figure 1. The throttle is controlled by means of the throttle control levers located on the left side of the cockpit. These levers are interconnected by the throttle control linkage. The throttle control levers transfer their movements to the throttle by means of the throttle control cable. This cable is routed on the left side of the fuselage, penetrates the firewall and is then routed centrally below the exhaust muffler to the throttle. In the engine compartment this cable is covered with a fire sleeve. The cable is attached to the fuselage using clamp blocks at its ends, self-clinching plastic tiedown straps in the cockpit area, and a cushioned clamp at the exhaust muffler. Rod ends at both terminals of the control cable serve as a means for rigging. The fire wall penetration is sealed with PRC-812 (Products Research & Chemical Corp., USA) firewall sealant and covered with clamp sheets.

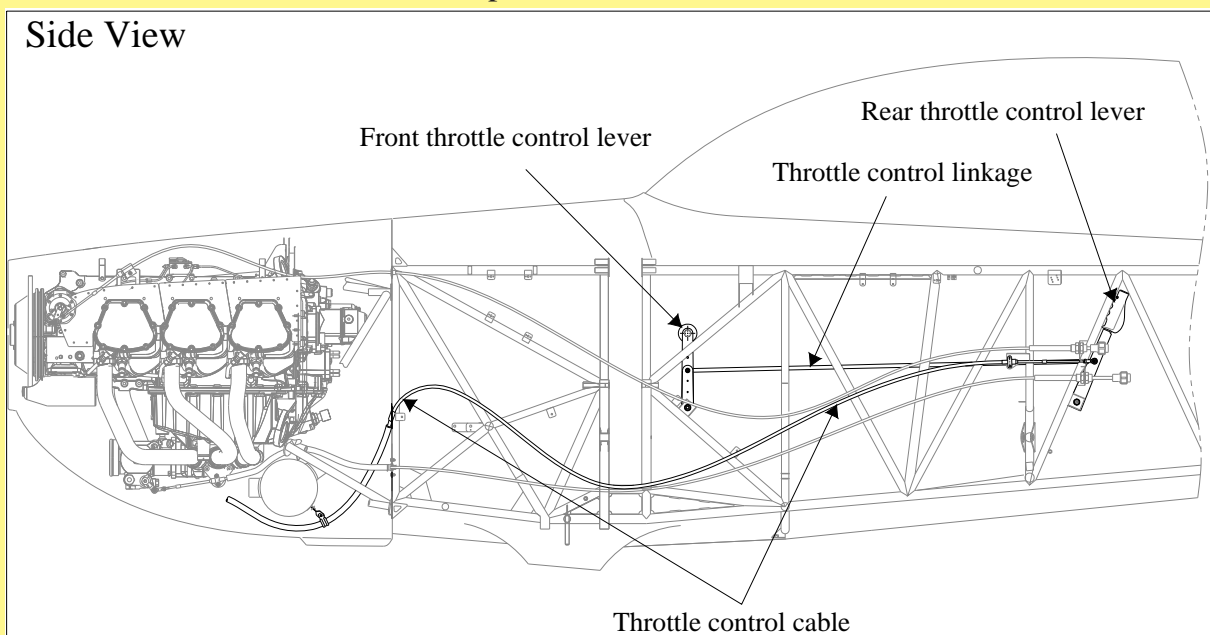


Figure 1

Throttle Control

## **73-20-11**

### **Throttle Control Cable**

Refer to chapter 20 for general information about handling of control cables.

#### **Removal**

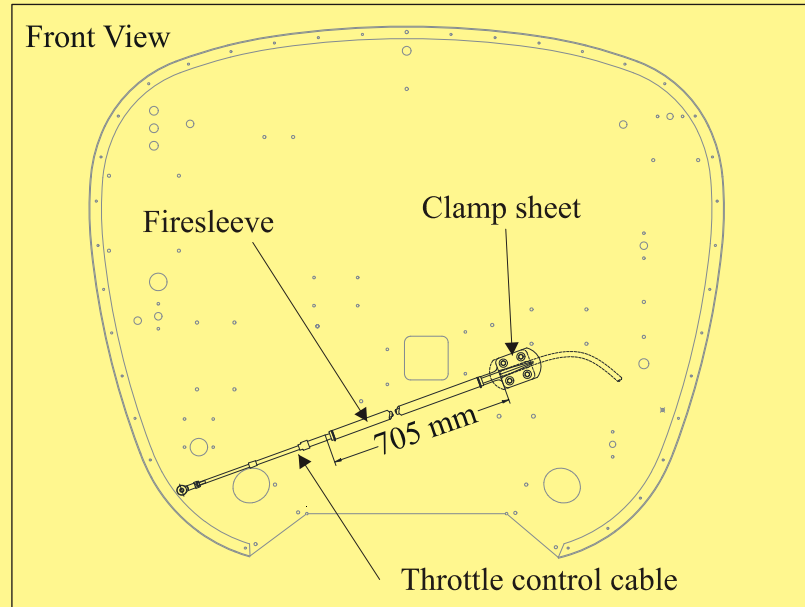
- 1 Ensure master switch is off.
- 2 Remove engine cowling per chapter 71.
- 3 Remove main fuselage cover per chapter 53.
- 4 Remove cotter pin, castle nut, washers and bolt from the rod end (2, figure 4) to throttle actuator (1) attachment.
- 5 Loosen counter nut and remove the rod end from the throttle control cable.
- 6 Remove rod end counter nut and throttle control cable protective swivel and wiper seal.
- 7 Remove clamp block (3) attachment bolt(s).
- 8 Remove clamp block from the throttle control cable.
- 9 Remove cushioned clamp (4) .
- 10 Cut safety wires and remove fire sleeve from the throttle control cable.
- 11 Remove 4 bolts and firewall sealant of the clamp sheets (figure 2) positioned at the firewall break through.
- 12 Mark throttle control cable routing and remove the self-clinching plastic tiedown straps in the cabin area.
- 13 Remove cotter pin, castle nut, washers and bolt and remove the rod end (6, figure 3) from the throttle control lever (5).
- 14 Loosen counter nut and remove the rod end from the throttle control cable.
- 15 Remove rod end counter nut and throttle control cable protective swivel and wiper seal.
- 16 Remove clamp block (4) attachment bolt(s).
- 17 Remove clamp block from the throttle control cable (8).
- 18 Pull complete throttle control cable aft to remove from aircraft. Secure clamp sheets.



## Installation

Install in reverse sequence of removal observing the following items:

- 1 Install throttle control cable, ensure distance between clamp sheet and clamp block is 705 mm (refer to figure 2).



*Figure 2 Firesleeve Length*

- 2 Renew the sealing of the firewall break through at the engine side of the firewall. Use PRC-812 (Products Research & Chemical Corp., USA) firewall sealant. Let the sealant slightly cure before tightening the clamp sheet attachment bolts. This will strengthen the clamping.
- 3 Install both rod ends to the control cable terminals. Ensure thread of control cable terminal is visible in the rod end inspection hole.
- 4 Tighten the castle nuts at both rod end attachment bolts slightly. Ensure movability of levers.

73-20-12

Rear Throttle Control Lever

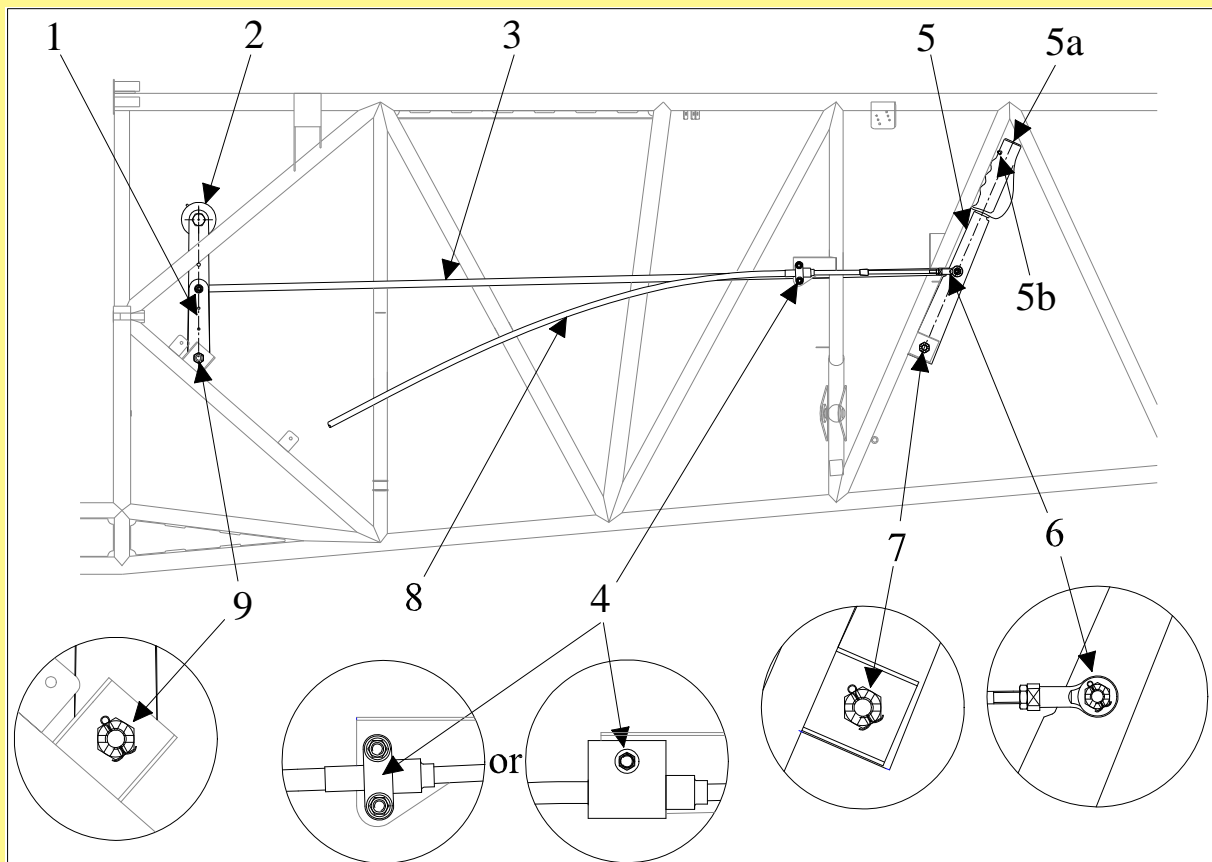


Figure 3

Throttle Control Levers

**Removal**

- 1 Ensure master switch is off.
- 2 Remove engine cowling per chapter 71.
- 3 Remove main fuselage cover per chapter 53.
- 4 Remove cotter pin, castle nut, washers and bolt (6, figure 3) and the throttle control linkage (3) from the throttle control lever (5).
- 5 Pull the smoke switch (5a, if installed) out of the throttle lever handle and disconnect switch wiring.
- 6 Remove intercom switch (5b) attachment nut. Remove self-clinching plastic tiedown straps of related wiring. Pull the intercom switch out of the throttle control lever grip.
- 7 Disconnect throttle control lever attachment by removing cotter pin, castle nut, washers and bolt (7). Remove throttle control lever.

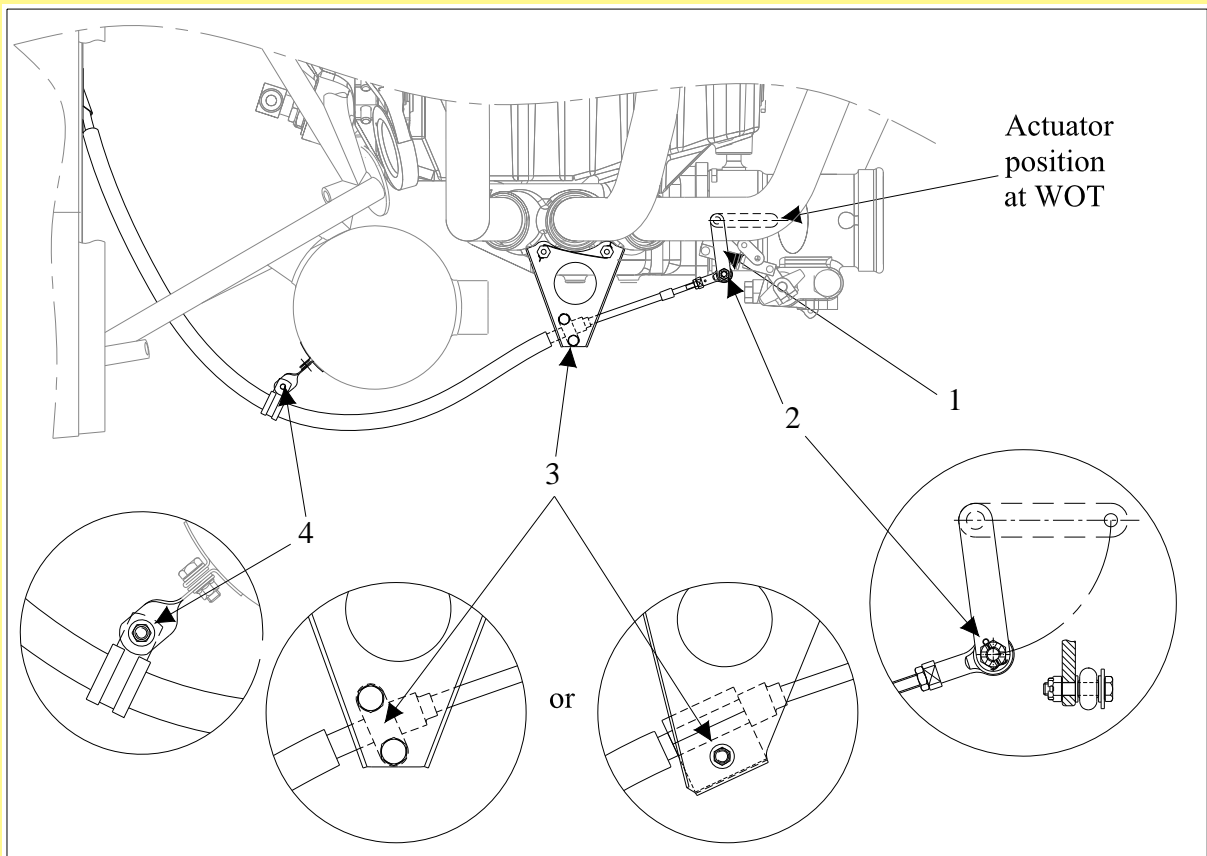
## Installation

Install in reverse sequence of removal observing the following items:

- 1 Thread the intercom switch (5b, figure 3) and the smoke switch (5a) wiring through the throttle control lever (5) before mounting the lever to the attachment bracket.
- 2 Tighten the throttle control lever castle nut (7) slightly. Ensure movability of control levers (1 & 5).

## Rigging

- 1 Move the rear throttle control lever (5, figure 3) in idle position parallel to the adjoining fuselage structure steel tube (as shown in figure 3).
- 2 Check throttle lever (1, figure 4) of the fuel injector servo reached travel stop for closed throttle.
- 3 Check usable stroke of control cable. The over-travel of the control cable in retracted and extended position shall be 8 to 13 mm [5/16"-1/2"]. Ref. to figure 2 of Chap. 20-10-09.



**Figure 4**

**Throttle Control Cable Rigging**

- 4 If necessary adjust rod ends (2, figure 4; 6, figure 3) to ensure correct over-travel by the following steps:
  - a Remove cotter pin, castle nut, washers and bolt of the rod end from throttle lever (1, figure 4) and rear throttle control lever (6, figure 3).
  - b Loosen the counter nut at rod ends and adjust travel positions and over travel by turning related rod end(s). Ensure thread is visible in the inspection hole when fastening. Apply inspection lacquer on the counter nut.
  - c Reconnect the rod ends.

## **73-20-12**

### **Front Throttle Control Lever**

#### **Removal/Installation**

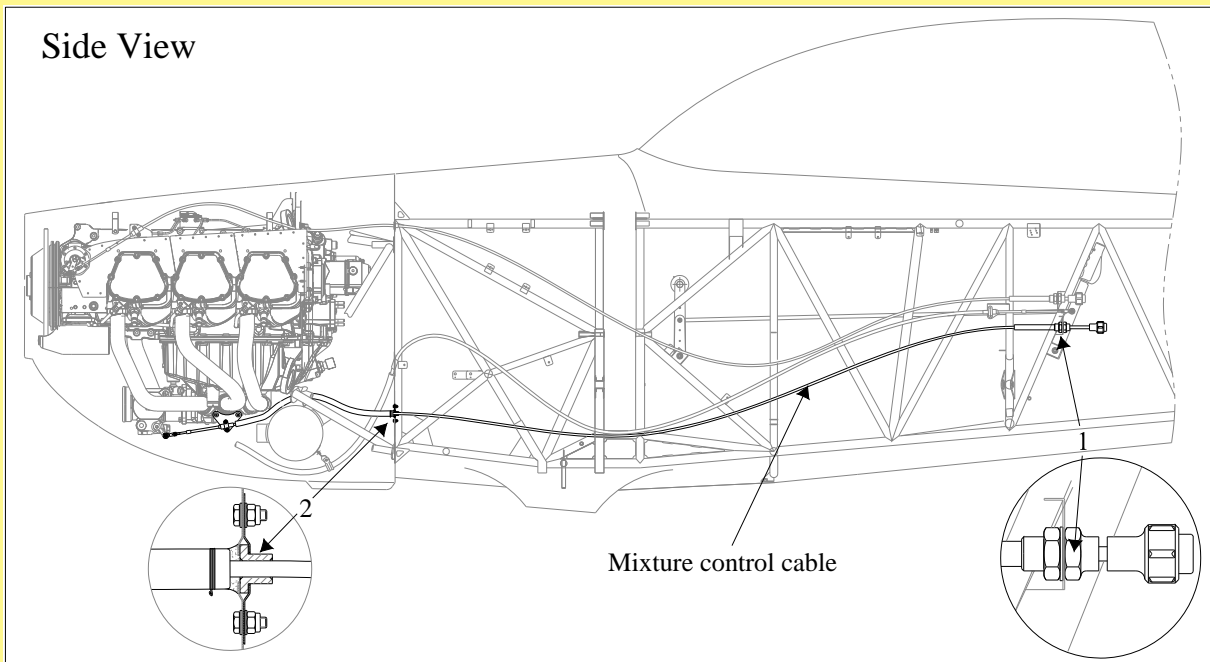
- 1 Ensure master switch is off.
- 2 Remove engine cowling per chapter 71.
- 3 Remove main fuselage cover per chapter 53.
- 4 Disconnect the throttle control linkage (3, figure 3) from the front throttle control lever (1).
- 5 Disconnect the throttle control handle (2) from the front throttle control lever (1).
- 6 Disconnect throttle control lever attachment by removing cotter pin, castle nut, washers and bolt (9) and remove throttle control lever.
- 7 Install in reverse sequence of removal. Tighten the throttle control lever castle nut (9) slightly. Ensure movability of levers.

## **73-20-20**

### **Mixture**

Refer to figure 5. The mixture of the fuel injector servo is controlled by means of the vernier mixture control cable located on the left side of the cockpit (red control knob). This cable is routed on the left side of the fuselage, penetrates

the firewall and is then routed to the mixture control lever. In the engine compartment this cable is covered with a fire sleeve. The cable is attached to the fuselage using a clamp block at its front end and self-clinching plastic tiedown straps in the cabin area. The mixture vernier control unit is mounted to a fuselage bracket. The fire wall penetration is sealed with PRC-812 (Products Research & Chemical Corp., USA) firewall sealant and covered with a clamp sheet.



**Figure 5**

**Mixture Control**

## 73-20-21

## Mixture Vernier Control Cable

Refer to chapter 20 for general information about handling of control cables.

### Removal

- 1 Ensure master switch is off.
- 2 Remove engine cowling per chapter 71.
- 3 Remove main and bottom fuselage cover per chapter 53.
- 4 Remove cotter pin, castle nut, washers and bolt from the rod end (2, figure 7) to mixer control lever attachment (3).

- 5 Loosen counter nut and remove the rod end (2) from the mixture control cable.
- 6 Remove rod end counter nut and mixture vernier control cable protective swivel and wiper seal.
- 7 Remove clamp block (1) attachment bolt(s).
- 8 Remove clamp block (1) from the vernier mixture control cable.
- 9 Cut safety wires and remove fire sleeve from vernier mixture control cable.
- 10 Remove 2 bolts of the clamp sheet attachment positioned at the firewall break through (2, figure 5). Disconnect clamp sheet and contained plastic guidance from the rear side of the firewall.
- 11 Mark mixture vernier control cable routing and remove the attachment self-clinching plastic tiedown straps in the cabin area.
- 12 Remove attachment nut and washer of the mixture control unit (1, figure 5).
- 13 To remove mixture vernier control unit from its bracket, pull the unit slightly aft (about 15cm [0.5ft]) and then to the LH outside direction.
- 14 Pull complete mixture vernier control cable aft to remove from aircraft. Secure clamp sheet.

### **Installation**

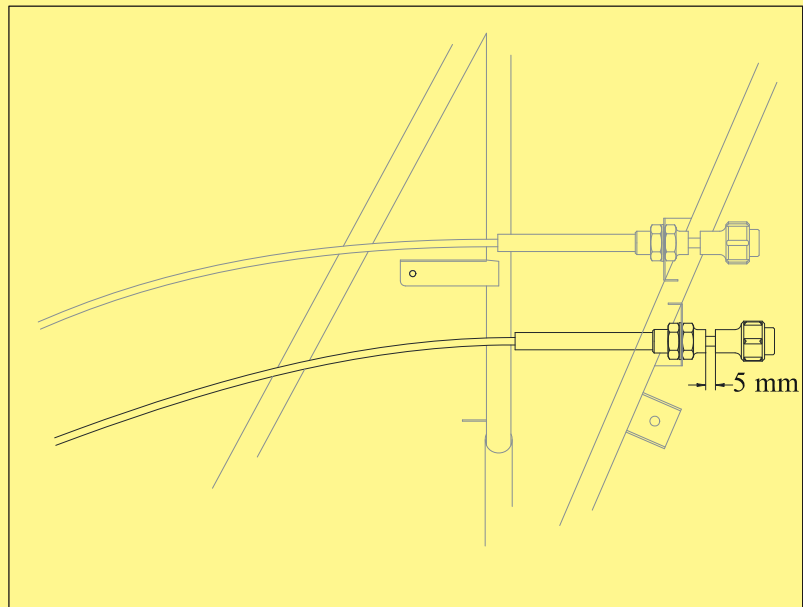
Install in reverse sequence of removal observing the following items:

- 1 Thread the respective rear clamp sheet and plastic guidance on the mixture control cable before penetrating the firewall.
- 2 Install rod end to the vernier mixture control cable terminal. Ensure thread of control cable terminal is visible in the inspection hole.

- 3 Renew the sealing of the firewall break through (2, figure 5) at the engine side of the firewall. Use PRC-812 (Products Research & Chemical Corp., USA) firewall sealant.
- 4 Tighten the castle nut slightly. Ensure movability of mixer control lever (3, figure 7).

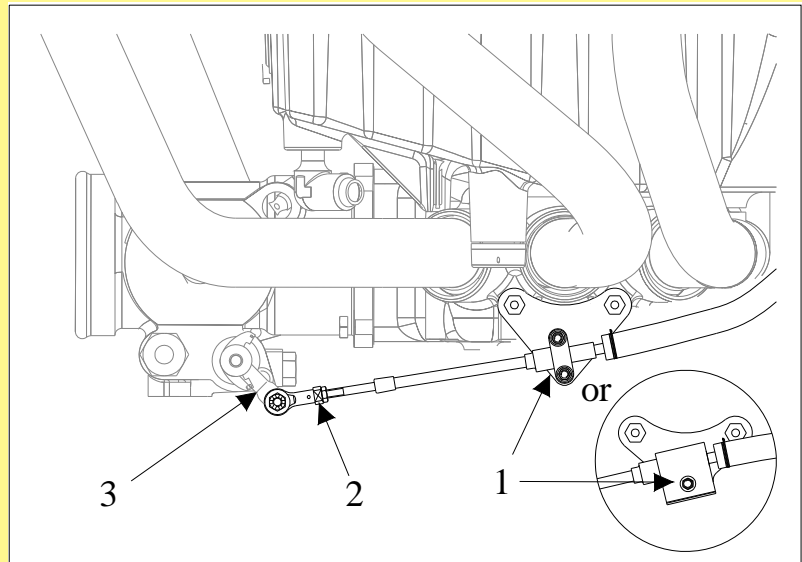
### **Rigging**

- 1 Move mixture control knob to the foremost position.
- 2 Check that the travel stop at the mixture control lever is reached, and the over-travel of 5mm [3/16"] (tolerance +/-1 mm [1/32"]) is ensured at the mixture control knob (see figure 6).



*Figure 6 Over-travel at Mixture Control Unit,*

- 3 Check full travel.
- 4 If necessary adjust rod end (2, figure 7) by the following steps:
  - a Remove cotter pin, castle nut, washers and bolt from the rod end (2) to mixer control lever (3) attachment.
  - b Loosen the counter nut and adjust rod end (2) by turning. Ensure thread is visible in the inspection hole when fastening. Apply inspection lacquer on the counter nut.
  - c Reconnect the rod end (2) to the mixture control lever (3).



*Figure 7*                      *Mixture Vernier Control Cable Rigging*